REMARKS

Applicant has carefully considered the Examiner's Office Action and has amended the claims responsively to define the invention in clearer form and to distinguish patentably from the prior art.

Thus, applicant has amended claims 1 and 4 to 8 to meet the provisions of 35 U.S.C. 112, second paragraph, and to include the subject matter and limitations that are not to be found in the prior art.

Applicant has also amended the specification to provide for the required section headings, and to avoid reference to specific claim numbers.

In considering the reference patent to Corradini (6,467,593), this patent discloses a hydraulic shock absorber with progressive braking, in which a cylinder is filled with fluid and a piston slides axially within the cylinder. The piston divides the cylinder into two chambers in operation of the extension and compression phases, the piston slides within the cylinder and causes the fluid to move from a lower one of the two chambers to the upper one of the two chambers. The fluid passes through ports and compression and extension valves.

In contrast to the reference patent to Corradini, applicant provides a variable flow resistance which is continuous and without steps that produces damping between soft and hard damping.

In applicant's invention, moreover, a bypass valve is provided to prevent pressure pulses in the damping fluid when the regulating valve transfers rapidly from open to closed positions. This corresponds to upward wheel shocks and sudden wheel accelerations.

In accordance with applicant's invention, sudden jolts are prevented when shifting between soft and hard damping, and thereby the riding comfort in the motor vehicle is improved.

Thus, the reference patent to Corradini does not at all disclose applicant's invention in which a regulated dashpot with shock-absorption force controls has at least one flow-regulating system including at least one shock-absorption component for the compression phase and the decompression phase. Electrical variable flow resistance is regulated by a regulating valve.

In accordance with applicant's invention, furthermore, and unlike the reference patent to Corradini, applicant provides at least one fixed bypass valve with a constricted cross-section that is hydraulically in parallel with the flow-regulating system.

Unlike the reference patent to Corradini, applicant provides, moreover, at least one flow regulating system for the compression phase and at least one flow regulating system for the decompression phase, in the form of regulating valves with variable flow constriction.

In applicant's invention, unlike the prior art reference patent to Corradini, moreover, the flow resistance is made electrically variable and provides continuous damping between soft and hard damping in a stepless manner. The bypass valve prevents pressure pulses in the damping fluid when the regulating valve moves rapidly from open to closed positions corresponding to upward wheel shocks and sudden wheel accelerations. As a result, applicant's invention provides that sudden jolts are prevented when shifting between soft and hard damping, so that passengers in the motor vehicle have a more comfortable riding experience.

It is submitted that the preceding features, including the parallel bypass valve, are not at all disclosed in the reference patent to Corradini.

Applicant provides for a new and marked improvement over the prior art.

Since the claims in the application define clearly the differences between applicant's invention and the prior art, it is believed that the claims should be found allowable.

The Examiner's attention is respectfully directed to the Court decision in the case of In re Bisley (94 U.S.P.Q. 80, 86), in which the Court ruled that patentability is gauged not only by the extent or simplicity of physical changes, but also by the perception of the necessity or desirability of making such changes to produce a new result. When viewed after disclosure, the changes may seem simple and such as should have been obvious to those in the field. However, this does not necessarily negate invention or patentability. The conception of a new and useful improvement must be considered along with the actual means of achieving it in determining the presence or absence of invention. The discovery of a problem calling for an improvement is often a very essential element in an invention correcting such a problem. Though the problem, once realized, may be solved by use of old and known elements, this does not necessarily negate patentability.

Furthermore, in the case of ex parte Chicago Rawhide Manufacturing Company (226 U.S.P.Q. 438), the Patent Office Board of Appeals ruled that the mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal, is not by itself, sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device. The Examiner has not presented any evidence to support the conclusion that a worker in this art would have had any motivation to make the necessary changes in the reference device to render the here-claimed device unpatentable.

In the case of United Merchants and Manufacturers Incorporated versus Ladd (139 U.S.P.Q. 199), the District Court

ruled that although from simplicity of device and with advantage of hindsight, one might offhandedly be of opinion that anyone should have been able to make invention after studying prior art, claims are allowed since none of the reference discloses or suggests the concept which is the crux of the invention.

Finally, in the case of Meng and Driessen (181 U.S.P.Q. 94), the Court decided that progress in crowded arts, usually made in small increments, is as important as it is in arts at the pioneer stage; constitution envisages and seeks progress in useful "arts," not just in those more esoteric or scientific.

Applicant has carefully studied the remaining references which were cited by the Examiner for being of interest but not applied in the case. After detailed analysis of these additional references, applicant has concluded that they are entirely unrelated to applicant's invention, and they do not anticipate the novel features of applicant's arrangement.

In view of the amendments to the claims and to the specification, and in view of the preceding remarks, it is respectfully requested that the claims in the application be allowed and the case be passed to issue.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D. C. 20231, on 4-14-03

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VERSION WITH MARKINGS TO SHOW THE CHANGES MADE S/N 10/008,895 as filed

REGULATED DASHPOT WITH SHOCK-ABSORPTION FORCE CONTROLS

BACKGROUND OF THE INVENTION

The present invention concerns a regulated dashpot with shock-absorption force controls, especially intended for motor vehicles, [as recited in the preamble to Claim 1.]

Regulated hydraulic dashpots with flow-regulating system that shift back and forth between compression and decompression phases in operation are known. Dashpots of this genus are described in German 3 803 838 C2 for instance.

There is a drawback to such dashpots in that their design permits them to shift only suddenly between the hard and soft phases, limiting the range of control. The comfortability of the ride can be increased only to a limited extent.

The object of the present invention is accordingly a dashpot of the aforesaid genus that can shift continuously between the hard and soft phases, whereby the valve-adjustment intervals can be varied at intervals that are not unnecessarily short or even unattainable.

[This object is attained by the characteristics recited in Claim 1. Advantageous and advanced embodiments are addressed in Claims 2 through 8.]

SUMMARY OF THE INVENTION

The present invention has many advantages. A continuous transition between hard and soft phases can be obtained by simple

means. Valve-adjustment intervals can be maintained long enough to allow the device to be manufactured at justifiable component costs and to be operated at low requisite adjustment powers.

One particular advantage is that the flow-regulating system can be modular and employed in different vehicles with various shock-absorption performances. Since there will be no sudden jolts when shifting between the hard and soft phases and vice versa, riding comfort will be considerably improved.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments of the present invention will now be specified by way of example with reference to the accompanying drawing, wherein

Figure 1 is a schematic illustrating how a dashpot can be regulated in accordance with a single-chamber principle,

Figures 2 through 11 are schematics illustrating various other approaches to regulation in accordance with the single-chamber principle,

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figures 12 and 13 are schematics illustrating how a dashpot can be regulated in accordance with a resilient-chamber principle and with a two-chamber principle, and Figure 14 is a schematic illustrating regulation inside a dashpot cylinder.